

Depression versus Anxiety: Differences in Self- and Other-schemata

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The phenomena of depression and anxiety have been closely related in clinical, empirical, and theoretical investigations. Among clinicians, a long-standing controversy has existed over whether anxious and depressive states are two separate disorders (Kraepelin, 1981/1883) or states belonging to different parts of a single continuum of affective disorders varying in severity (Lewis, 1934; 1938). By the mid-1970s, the consensus of opinion in psychiatry was that anxiety and depression were separate but related disorders. This opinion was largely shaped by a series of psychiatric studies suggesting that clinical samples of depressed and anxious patients could be discriminated with respect to symptomatology, personality, past history, and treatment response (e.g., Garber, Miller, & Abramson, 1980; Gersh & Fowles, 1979; Grinker, 1966; Gurney, Roth, Garside, Kerr, & Schapira, 1972; Klerman, 1977; Levitt & Lubin, 1975; Mathew, Swihart, & Weinman, 1982; Murray & Blackburn, 1974; Parkes, 1981; Prusoff & Klerman, 1974; Roth, Gurney, Garside, & Kerr, 1972; Roth & Mountjoy, 1982). However, several more recent clinical, family, and treatment studies have raised the possibility that depressive and anxiety disorders share a common diathesis (Barlow, 1985; Foa & Foa, 1982; Klein, 1980; Leckman, Merikangus, Pauls, Prusoff, & Weissman, 1983; Leckman, Weissman, Merikangus, Pauls, & Prusoff, 1983; Weissman, Leckman, Merikangus, Prusoff, & Gammon, 1983). In general, both sets of psychiatric studies have ignored theoretical processes that may account for both the differences and the similarities between the two affective phenomena.

In contrast, psychological investigations have presented more sophisticated theoretical accounts of depression and anxiety but have not considered the two phenomena within a single, unifying framework (e.g., Abramson, Seligman, & Teasdale, 1978; Epstein, 1972, 1976; Lazarus & Averill, 1972; Lewinsohn, 1974;

Mandler, 1972; Mandler & Watson, 1966; Sarason, 1975; Spielberger, 1972). Indeed, it appears that two parallel literatures exist within psychology, with many of the same paradigms and concepts used separately to account for depression and anxiety. For example, investigators have emphasized threats to self-esteem, fear of failure, negative cognitions, helplessness, and performance deficits as central to the understanding of both depression and anxiety (e.g., Abramson *et al.*, 1978; Beck, 1967, 1976; Garber *et al.*, 1980; Mandler, 1972; Sarason, 1975; Spielberger, 1972). Thus most relevant research on the relationship between depression and anxiety appears to fall into two separate literatures, with relatively few studies attempting to provide an integrated theoretical account of the two disorders.

In this chapter, we employ a cognitive "schema" framework for investigating the similarities and differences between depression and anxiety, and present findings from two studies (Greenberg & Alloy, 1987; Vazquez & Alloy, 1987) examining the self- and other-schemata of depressed and anxious individuals. Before presenting our rationale for adopting a schema approach to the integrated study of depression and anxiety, and our empirical findings with this approach, we first briefly discuss classificatory and diagnostic distinctions in these two disorders and review clinical, familial, and psychometric studies that investigate their interrelation.

CLASSIFICATORY AND DIAGNOSTIC DISTINCTIONS IN DEPRESSION AND ANXIETY

Depression is a heterogeneous concept, and many investigators have presented classification schemes for this disorder (e.g., Craighead, 1980; Depue & Monroe, 1979). Kendell (1976) reviewed some of the diagnostic schemes that have been formulated; a brief list of them conveys the complexity of the concept of depression: unipolar-bipolar (Depue & Monroe, 1979); primary-secondary; anxious, hostile, psychotic, and young depressives with personality disorders (Paykel, 1971, 1972a, 1972b); harried depression, pure melancholy, self-torturing depression, suspicious depression, nonparticipatory depression, hypochondriacal depression (Leonhard, 1979); endogenous-neurotic depression (Fowles & Gersh, 1979). The various classification schemes that have been proposed for depressive disorders typically describe fundamentally different clinical patterns of depression. However, the evidence for the validity of these subtypes varies, with minimal support found for specific categories, such as hypochondriacal and suspicious depression, but widespread acceptance for the broad distinctions of unipolar-bipolar (Depue & Monroe, 1979) and endogenous-nonendogenous depression (Fowles & Gersh, 1979).

The term "anxiety" has also been employed in a wide variety of contexts. For example, anxiety has been described as a protective signal, a drive, a conditioned form of fear, a trait, a state, an innate disposition, a syndrome, and a clinical diagnosis (Mandler, 1972). With respect to psychopathology, some of the more common distinctions include state-trait anxiety (Spielberger, 1972), acute-chronic anxiety (Gray, 1978; Schweitzer & Adams, 1979), and free-floating versus panic

anxiety (Beck, 1967). Although distinctions among types of anxiety states have been offered, these distinctions represent relatively less complex classification schemes than those proposed for depression. Distinctions among anxiety states appear to be based upon unidimensional criteria, such as severity, temporal duration of the phenomena, the presence of panic attacks, and subjective perception of the source of threat (Barlow, 1985; Jablensky, 1985). However, it does seem that the phenomenological subtypes of anxiety featured in the DSM-III (APA, 1980), including agoraphobia, social phobia, simple phobia, panic disorder, generalized anxiety disorder, and obsessive-compulsive disorder, can be reliably distinguished from one another (Barlow, 1985).

What is the relationship between anxiety and the various clinical forms of depression? A large number of psychiatric and psychometric studies suggest that anxiety is differentially associated with various forms of clinical depression (e.g., Kiloh & Garside, 1963; Levitt & Lubin, 1975; Nelson & Charney, 1981; Rosenthal & Klerman, 1966). These studies suggest that overt anxiety is commonly found in reactive and neurotic depression (e.g., Grinker & Nunally, 1968; Prusoff & Klerman, 1974) but infrequently observed in psychotic, bipolar, and other more severe forms of depression (Depue & Monroe, 1979).

However, it would be simplistic and misleading to conclude that anxiety is of minimal importance in severe forms of depression (Leonhard, 1979; Lorr, Sonn, & Katz, 1967; Paykel, 1972a; Teja, Narang, & Aggarwal, 1971). Grinker (1966) argued that anxiety is often present in patients who appear withdrawn, retarded, and in "physiological hibernation." When these patients begin to recover from their depressive reactions, the appearance of behavioral anxiety and elevations in hormones related to activity and anxiety (adrenocortical hormones) become prominent. In agreement, Overall and Zisook (1980) suggested that anxiety usually accompanies depressed mood in all types of depression. Gersh and Fowles (1979) reviewed evidence suggesting that clinical agitation may be a severe but atypical manifestation of anxiety, although there is considerable disagreement on this issue. These writers suggested that anxiety may be present in all subtypes of depression, although it may be overshadowed by psychomotor retardation or neurovegetative signs, or may appear in atypical form as agitation in severe, psychotic, or endogenous depressions.

Not only is anxiety a common feature of depressive clinical presentations (Jablensky, Sartorius, Gulbinat, & Ernberg, 1981), but the differential diagnosis of depressive and anxiety disorders is also quite difficult. Both anxiety and depression are marked by feelings of dysphoria, apprehension, tension, excessive worrying, and self-preoccupation (Sarason, 1985; Spielberger, 1972), and the inclusion criteria for the two disorders in DSM-III are similar in a number of respects. Barlow (1985) reported that depressive diagnoses (either major affective disorder or dysthymic disorder) occurred as an additional diagnosis with high frequency among patients with anxiety disorders. Specifically, 66% of obsessive-compulsive, 39% of agoraphobic, 35% of panic-disordered, 21% of social-phobic, and 17% of generalized-anxiety-disordered patients also met DSM-III criteria for a depressive disorder. Indeed, in proposing revisions for DSM-III, Spitzer and Williams (1985) suggested

the removal of the hierarchical principle by which a diagnosis of major depression excludes a concurrent diagnosis of an anxiety disorder.

CLINICAL AND FAMILIAL DISTINCTIONS BETWEEN DEPRESSION AND ANXIETY

Although depression and anxiety are difficult to differentiate, a series of studies by Roth and his colleagues suggested that the two disorders may be separate and distinctive (Gurney *et al.*, 1972; Kerr, Roth, & Schapira, 1974; Roth *et al.*, 1972; Schapira, Roth, Kerr, & Gurney, 1972). Patients admitted to a hospital with a diagnosis of either "depressive illness" or "anxiety state" were studied prospectively in terms of presenting symptoms, family history, premorbid personality characteristics, and outcome at an average of 3.8 years after the initial assessment. Although the two groups of patients showed a number of overlapping features, there were significant differences in clinical symptomatology, personality, family history, and clinical outcome. Panic attacks, vasomotor signs, dizziness, emotional lability, depersonalization, derealization, and agoraphobic experiences occurred with much higher frequency in the anxious patients, whereas worse depression in the morning, depressive mood reactive to change, psychomotor retardation, early waking, and suicidal acts were more common in the depressed patients. Depressive mood and tension were equally frequent in the two diagnostic groups; however, the combination of persistent depression and episodic tension was more common among patients with depressive illnesses, whereas the combination of episodic depression and chronic tension was characteristic of the patients with anxiety states. With respect to family history, neurotic and personality disorders were more frequent in the parents and siblings of patients with anxiety states than in the families of depressed patients. Anxiety patients also exhibited more social anxiety and maladjustment than their depressed counterparts. Finally, the patients with an initial diagnosis of depressive illness had a better prognosis than the patients with diagnoses of anxiety states, and symptomatological "crossover" during the course of the two groups' disorders was rare.

However, several recent family and treatment studies suggest that depressive and anxiety disorders may not be completely separate entities. Leckman, Weissman, and their colleagues (Leckman, Merikangus, Pauls, Prusoff, & Weissman, 1983; Leckman, Weissman, Merikangus, Pauls, & Prusoff, 1983; Weissman *et al.*, 1984a, 1984b) found that individuals with an anxiety disorder are at increased risk to develop either another anxiety disorder or major depression, and that first-degree relatives of probands with both major depression and an anxiety disorder showed higher rates of major depression and anxiety disorders than the relatives of patients with either one of the disorders alone. The highest rates of depression and anxiety were found in relatives of probands with both depression and panic disorder. On the basis of these studies, Weissman (1985) suggested that panic disorder (and perhaps agoraphobia) is more similar to depression than to other anxiety disorders and that it may be a manifestation of the same underlying diathesis.

Other family (Cloninger, Martin, Clayton, & Guze, 1981; Crowe, Noyes, Pauls, & Slyman, 1983) and genetic (Torgerson, 1983) studies are more supportive of the hypothesis that the two affective states are distinct. Pharmacological studies have also provided evidence for the similarity of panic states and depression. Klein (1980) reported that tricyclic antidepressants were effective in treating panic disorder and agoraphobia, whereas benzodiazepines, normally the drugs of choice for treating anxiety, did not work for these anxiety subgroups. Van Valkenburg, Akiskal, Puzantian, and Rosenthal (1984) also found that on most phenomenological, familial, treatment-response, and outcome measures, patients with primary panic, panic complicated by depression, depression complicated by panic, or primary depression formed a spectrum, with primary panic and primary depression constituting the extremes of a continuum joined by the two intermediate groups of anxious depressions.

PSYCHOMETRIC STUDIES OF DEPRESSION AND ANXIETY

In general, psychometric studies have had even less success in discriminating depression and anxiety than studies examining clinical, physiological, and genetic variables. For example, Mendels, Weinstein, and Cochrane (1972) attempted to discriminate between depression and anxiety in psychiatric patients by the use of several self-report measures and found that depression and anxiety scales loaded on the same (first) factor when the tests were factor analyzed. In addition, the anxiety scales correlated higher with the depression scales than they did with each other. Mendels *et al.* concluded that depression and anxiety scales could not be separated into two factors but instead represented a general dimension of psychological distress (see also Gotlib, 1984; Nezu, Nezu, & Nezu, 1986). Similar correlations have been reported in other psychometric investigations of depression and anxiety (e.g., Biglan & Dow, 1981; Gotlib, 1984; Meites, Lovallo, & Pishkin, 1980; Serra & Pollitt, 1975).

Psychometric studies that have not obtained differences between depression and anxiety have usually employed undiagnosed subject groups (e.g., Gotlib, 1984; Mendels *et al.*, 1972). It appears that studies of this type are less likely to differentiate depression and anxiety scales/symptoms because the two phenomena coexist in so many clinical states, medical conditions, and nonclinical mood variations (Jablensky, 1985). For example, studies examining college samples (Greenberg & Alloy, 1987; Miller, Seligman, & Kurlander, 1975) are usually unable to identify a substantial number of subjects who are depressed but not anxious.

In contrast to the preceding reports, several psychometric studies have been successful in discriminating between depression and anxiety (Costello & Comrey, 1967; Derogatis, Lipman, Covi, & Rickles, 1972; Riskind, Beck, Brown, & Steer, 1986; Tellegen, 1985). Costello and Comrey reported that it was the presence of depression and not anxiety that distinguished between preselected depression and anxiety groups (see also Gersh & Fowles, 1979; Roth *et al.*, 1972). Tellegen (1985)

found that although both depressed and anxious subjects endorsed "unpleasant mood" items on a self-report personality questionnaire, anxious subjects loaded more heavily on High Negative Affect, whereas depressed subjects loaded more highly on Low Positive Affect. In general, studies that have obtained psychometric differences between depression and anxiety have often compared relatively carefully defined subgroups of depressed and anxious individuals. Further, group differences are maximized when the ratio of depressive to anxious symptoms is carefully considered before assigning a subject to a particular group (Riskind *et al.*, 1986).

In sum, the relationship between depression and anxiety remains quite unclear, and the majority of clinical, familial, and psychometric studies designed to investigate their association are characterized by a distinct element of "blind empiricism." Although psychological studies have been more concerned with conceptual issues (e.g., Abramson *et al.*, 1978; Lewinsohn, 1974; Sarason, 1975; Spielberger, 1972), these studies have failed to consider depression and anxiety in a single framework. Thus progress toward resolving the interrelation between these two disorders may depend on the development of an integrated theoretical framework.

A COGNITIVE-SCHEMA APPROACH TO DEPRESSION AND ANXIETY: RATIONALE

In line with recent cognitive-information-processing approaches to the study of psychopathology, we employ in this chapter the construct of cognitive schemata as mechanisms that may account for both the overlap and the differences between depression and anxiety. The term "schema" refers to an enduring cognitive organization that acts as a pattern for selecting, encoding, retrieving, and interpreting the stimuli that confront an individual. Cognitive schemata enable an individual to break down and filter the vast array of stimuli impinging upon him or her at any given moment, thus serving a function of "cognitive economy" (Rosch, 1975).

Because the quantity and variety of information available at any time is greater than what any person could process, individuals must be selective in what they notice, learn, remember, or infer in any situation (Neisser, 1967). Information that is inconsistent with the general organization of the schema is often ignored or forgotten; other aspects of the information are elaborated in ways that make them consistent with the schema (e.g., Bartlett, 1932; Bobrow & Norman, 1975; Bower, Black, & Turner, 1979; Bransford & Johnson, 1972, 1973; Minsky, 1975; Owens, Bower, & Black, 1979). Thus, although schemata facilitate perception, comprehension, recall, and problem solving, an important consequence of their operation is bias and distortion (e.g., Alloy & Tabachnik, 1984; Taylor & Crocker, 1980).

A major impetus for examining schematic processes in depression and anxiety is Beck's comprehensive theory of the emotional disorders (Beck, 1967, 1976; Beck & Emery, 1985). Beck's major premise is that affective responses are largely determined by a person's cognitive construction of his or her experiences. Accord-

ing to Beck, individuals suffering from each of the emotional disorders can be characterized as possessing enduring and maladaptive cognitive schemata that contain specific negative beliefs about the self and its relationship to the world and the future. Beck argues that these negative schemata dominate the cognitions of depressed or anxious individuals, leading to systematic biases and distortions in the perception and interpretation of self-relevant information (Alloy, Clements, & Kolden, 1985).

In Beck's (1976) model, the emotional disorders can be distinguished from one another on the basis of the specific content of their self-schemata. Depressed individuals are hypothesized to possess negative schemata involving the depressive themes of personal deficiency, worthlessness, self-blame, guilt, deprivation, and rejection. Anxious individuals also have negative beliefs about the self, but their schemata are organized around the themes of threat, danger, and uncertainty (Beck, 1976; Beck & Emery, 1985; see also Epstein, 1976; Mandler, 1972; Spielberger, 1972). Thus Beck's theory predicts that depressed and anxious individuals can be differentiated on the basis of the specific content of their self-schemata, whereas the operation of self-schemata is similar in the two groups.

Recently, a variety of empirical methods for detecting schemata and their effects on information processing have been developed by cognitive psychologists (e.g., Bower *et al.*, 1979; Bransford & Johnson, 1972, 1973; Owens *et al.*, 1979; Rogers, 1981). These various methods have converged on the general finding that although schemata facilitate perception and recall of schema-relevant information, their operation leads to biased processing because available data are assimilated by the schemata (Alloy & Tabachnik, 1984; Taylor & Crocker, 1980). Schema approaches have also recently influenced social and personality psychology as theorists have become increasingly interested in the role of enduring knowledge structures in complex social behaviors (e.g., Cantor & Mischel, 1977; Markus, 1977; Schank & Abelson, 1975). In particular, personality studies have supported the existence of a well-organized self-schema that influences a person's endorsement of trait adjectives as personally descriptive, increases the efficiency or speed of processing stimuli that match the self-schema content, and enhances the recall of schema-consistent information while at the same time producing erroneous recall and recognition of self-schema-congruent material that was never presented (e.g., Markus, 1977; Rogers, Kuiper, & Kirker, 1977).

Self-schemata in Depression and Anxiety

In the last few years, clinical investigators have applied methods developed within cognitive and social psychology to an examination of the content and operation of self-schemata in depressed and nondepressed people (Alloy, Greenberg, Clements, & Kolden, 1983; Davis, 1979a, 1979b; Davis & Unruh, 1981; Derry & Kuiper, 1981; Hammen, Marks, de Mayo, & Mayol, 1985; Hammen, Marks, Mayol, & de Mayo, 1985; Hammen, Miklowitz, & Dyck, 1986; Ingram, Smith, & Brehm, 1983; Kuiper & Derry, 1982; Kuiper & MacDonald, 1982; Kuiper, Olinger, & MacDonald, Chapter 10, this volume; Kuiper, Olinger, MacDonald, & Shaw, 1985; Ross

& Mueller, 1983; Ross, Mueller, & de la Torre, 1986). This research clearly demonstrates that normal, nondepressed individuals are characterized by strong, positive-content self-schemata that increase their endorsement of, processing efficiency for, and recall of positive self-referent information. The evidence regarding depressives' schematic processing is less clear cut. Some evidence suggests that consistent with the content-specificity hypothesis (Beck, 1967, 1976), clinically depressed patients may exhibit strong self-schema processing effects, parallel to those of nondepressives, with the exception that depressives' schemata are negative in content (Derry & Kuiper, 1981). In contrast, other studies suggest that depressed individuals may possess relatively unstable self-schema containing mixed positive and negative content (e.g., Ingram *et al.*, 1983; Kuiper & Derry, 1982; Kuiper & MacDonald, 1982; Kuiper *et al.*, 1985).

Whether depressed individuals possess strong negative self-schemata or balanced, mixed-content schemata may depend on the severity (Kuiper & Derry, 1982; Kuiper & MacDonald, 1982) and/or chronicity of their symptoms (Davis, 1979a, 1979b; Davis & Unruh, 1981). Kuiper and MacDonald (1982) argued that mildly depressed people may be characterized by a period of uncertainty or confusion regarding their self-concepts and therefore show information processing characteristic of a mixed-content schema or inconsistent effects across schematic processing tasks. However, as depression either increases in severity or decreases to nondepressed levels, the relative balance of positive versus negative content is hypothesized to change, thereby giving rise to "content-specificity" effects.

Unfortunately, the role of anxiety has been ignored in these studies of depressed and nondepressed individuals' self-schemata. Inasmuch as depressive and anxious symptoms are closely related, particularly in milder forms of depression (e.g., Costello & Comrey, 1967; Gotlib, 1984; Mendels *et al.*, 1972; Miller *et al.*, 1975; Prusoff & Klerman, 1974), it is unclear whether the depressed-nondepressed differences in schematic processing obtained in these studies are attributable to subjects' differing levels of depression or to anxiety. In fact, the two experiments that have explicitly examined the self-schemata of test-anxious individuals (Lang, Mueller, & Nelson, 1983; Mueller & Curtois, 1980) have found increased endorsement and recall of negative-content trait adjectives for this group as well. To date, however, no one has adequately investigated the specificity of the content and operation of self-schemata in depressed versus anxious persons by specifically comparing the schematic processing of the two groups within a single study. Our two studies—Greenberg and Alloy (1987) and Vazquez and Alloy (1987)—which we report on later, address this issue (see also Clements, Alloy, Kolden, & Greenberg, 1987).

A second important feature of the studies reported here, relevant to testing Beck's content-specificity model, is that we employ positively and negatively valenced trait adjective stimuli whose contents are specifically related to depressive, anxious, and normal themes. The content-specificity hypothesis and basic schema research suggest that schematic processing effects should be limited to stimulus material congruent with the content embodied in the self-schema (Derry & Kuiper, 1981; Riskind & Rholes, 1984; Taylor & Crocker, 1980). This is because informa-

tion that matches the content of the self-schema can be quickly and elaborately encoded and later readily retrieved (Rogers, 1981). The previous research on self-schemata in depression and anxiety has paid insufficient attention to the content of the stimuli used and has often incorrectly assumed that depressed or anxious subjects will exhibit more efficient processing and recall of any negatively valenced information.

Self- versus Other-schemata

A final way in which the studies we report here investigated the specificity of depressed and anxious persons' self-schemata was by also examining these subjects' processing of information encoded in reference to another person. It is possible that schematic effects observed for self-referent encoding are due merely to the accessing of any well-organized "person" schema rather than to a schema with content unique to the self (Bower & Gilligan, 1979; Kuiper & Rogers, 1979). A comparison of subjects' schemata for a well-known other person (a best friend) to their self-schemata provides a relatively stringent test of the content-specificity hypothesis.

Moreover, the "self-other" distinction is a critical feature of Beck's (1967, 1976) cognitive model. Beck (1967) has argued that depressed individuals' cognitions are characterized by a systematic "bias against the self" in which they compare themselves unfavorably to others. More generally, several social psychological theories hypothesize that people's self-esteem is influenced by their comparisons of themselves to others (e.g., Festinger, 1954; Morse & Gergen, 1970; Rosenberg, 1965; Schachter, 1959). That depressed and anxious people both typically exhibit low self-esteem (e.g., Beck, 1976; Beck & Emery, 1985; Bibring, 1953; Epstein, 1972; Nadich, Gargan, & Michael, 1975; Sarason, 1975; Spielberger, 1972) suggests that both groups may perpetuate or accentuate their negative self-images by perceiving others in highly positive terms (Alloy & Ahrens, 1987; Martin, Abramson, & Alloy, 1984; Tabachnik, Crocker, & Alloy, 1983). This line of theorizing and research suggests a social-comparison hypothesis (Alloy, Albright, & Clements, 1987; Kuiper & MacDonald, 1982) in which depressed and anxious subjects may exhibit negative self-schemata specific to depressive and anxious content, respectively, but schemata for others that contains positive content. Similarly, recent work documenting self-enhancing biases in nondepressive cognition (Abramson & Alloy, 1981; Alloy *et al.*, 1987; Greenwald, 1980) suggests that normal subjects may maintain positive self-esteem by also exhibiting a social-comparison effect in which their other-schemata are more negative than their self-schemata. Because depressed and anxious persons are most likely to compare themselves negatively, and normal persons, to compare themselves positively, to an unfamiliar, generalized other (Alloy *et al.*, 1987; Beck, 1976), in one of the two studies we report on here (Vazquez & Alloy, 1987), we used "people in general" as a comparison "other" in addition to subjects' best friends.

An alternative, self-consensus hypothesis is that self-schemata influence individuals' perceptions and judgments of others (Fong & Markus, 1982; Markus &

Smith, 1981). This hypothesis suggests that the presence of an organized self-schema may bias an individual to perceive others in a similar fashion. Along related lines, studies of the "false-consensus effect" (Ross, Greene, & House, 1977) suggest that people tend to perceive high consensus in others for their own attributes. This line of reasoning, therefore, predicts that differences among depressed, anxious, and normal subjects in their self-referent processing will be accompanied by similar differences in their processing of other-referent information.

SELF- AND OTHER-SCHEMATA IN DEPRESSION VERSUS ANXIETY: TWO EMPIRICAL STUDIES

In overview then, we present two studies, by Greenberg and Alloy (1987) and Vazquez and Alloy (1987), whose common goal was the investigation of depressed and anxious individuals' processing of information about themselves and others. Both studies used a "depth-of-processing" paradigm (Craik & Tulving, 1975; Derry & Kuiper, 1981) to provide a stringent test of Beck's content-specificity model of the emotional disorders. In both studies, we examined the self- and other-schemata (best friend and/or people in general) of depressed students, anxious but nondepressed students, and normal students for positive and negative depression-relevant, anxiety-relevant, and control content. In the depth-of-processing paradigm, subjects rate the descriptiveness of each of a series of adjectives on a semantic, self-referent, or other-referent orienting task. Following the orienting task, they are given a memory test (either recall or recognition) for the adjectives they rated in the encoding phase.

The typical findings in depth-of-processing experiments are recall enhancement of, and false recognition for, schema-congruent information encoded with reference to the self as well as faster processing and greater endorsement of self-schema-congruent stimuli (e.g., Cantor & Mischel, 1977; Derry & Kuiper, 1981; Rogers *et al.*, 1977). Thus Beck's content-specificity model of the emotional disorders suggests that depressed subjects will exhibit these typical effects only for negative, depression-relevant content encoded with reference to the self, whereas anxious subjects will exhibit these effects only for negative, anxiety-relevant content encoded in self-referent fashion. Given that the Greenberg and Alloy (1987) and Vazquez and Alloy (1987) experiments studied relatively mildly depressed individuals who were also anxious, a weaker version of the content-specificity hypothesis, in which depressed subjects exhibit evidence of self-schemata containing mixed positive and negative and depression-relevant and anxiety-relevant content, may be expected to receive support.

Although our two studies were quite similar in design and procedure, three differences should be mentioned. First, like most depth-of-processing studies in depression (e.g., Derry & Kuiper, 1981; Kuiper & Derry, 1982), Greenberg and Alloy (1987) used a free-recall test to evaluate subjects' memory for the trait adjectives processed with respect to different referents (self, other). In contrast, Vazquez and Alloy (1987) used a recognition test to examine subjects' abilities to

discriminate between adjectives they rated in the encoding phase and "new," similar distractors (see Brown, 1976, and Gillund & Shiffrin, 1984, for conceptual differences between recall and recognition). An advantage of a recognition test is that it is sensitive to distortions, or "false alarms," in the retrieval of schema-congruent information (Hastie & Carlston, 1980). This consideration is important, because strong cognitive schemata (e.g., self-schemata) may be powerful devices for processing relevant information, but, by the same token, they may lead to the distortion of such information (Alba & Hasher, 1983; Taylor & Crocker, 1980). In addition, when using a recognition test, signal detection theory (e.g., Green & Swets, 1966; McNicol, 1972) provides a way of assessing subjects' "response biases" as well as their memory sensitivities. That is, two subjects may possess different response styles in retrieving information from memory (e.g., "risky" vs. "conservative"), even though both show the same level of memory sensitivity or discriminability.

A second difference between the two studies is that Vazquez and Alloy (1987) included "people in general," in addition to "best friends" (the only "other" used by Greenberg and Alloy, 1987), as a comparison target for assessing subjects' other-schemata. As noted previously, the inclusion of a generalized other as a comparison target contributes to a stronger test of the social-comparison versus self-consensus hypotheses of the relation between self- and other-schemata.

Finally, Vazquez and Alloy (1987) investigated the effects of the severity of depression on the schematic processing of self- and other-referent information by including a moderately depressed group as well as a mildly depressed group in their study.

Selection and Matching of Task Stimuli

As discussed previously, an important requirement for an adequate test of the content-specificity hypothesis is that subjects be provided with stimulus content for processing that is *specific* to their pathology. Activation of negative self-schemata is more likely to occur when individuals with affective disturbances are exposed to specific events or stimuli that are congruent with the content embodied in their schemata (Alloy *et al.*, 1985; Derry & Kuiper, 1981; Riskind & Rholes, 1984). This point has often been overlooked in studies (e.g., Davis & Unruh, 1981; Dobson & Shaw, 1987; Zuroff, Colussy, & Wielgus, 1983) that have examined the schematic processing of depressed subjects. Therefore we developed for use in our two studies a set of trait adjectives with depression-relevant, anxiety-relevant, and control content.

The selection of these adjectives involved two major phases (see Greenberg & Alloy, 1987, for details). First, a large sample of undergraduates were asked to rate their self-concepts on a questionnaire containing 53 bipolar semantic differential items (Self-Perception Questionnaire; Greenberg & Alloy, 1987). These items were designed to be relevant to either depression (e.g., incompetent-competent) or anxiety (e.g., nervous-calm), or to be irrelevant to both depression and anxiety (e.g., untrustworthy-trustworthy). From this original pool of items, three lists of adjectives—depression-relevant (DR), anxiety-relevant (AR), and control (C)

adjectives—were empirically formed, based on their ability to discriminate among depressed, anxious but nondepressed, and nondepressed–nonanxious subjects within the sample. For instance, AR adjectives were those for which anxious subjects obtained higher mean ratings than nonanxious subjects and that correlated more strongly with subjects' scores on the Trait Anxiety Inventory (TAI; Spielberger, Gorsuch, & Luschene, 1970) than on the BDI (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961).

In the second phase of adjective selection, we added synonymous adjectives of each type in order to increase the length of the three lists. Fifty subjects then rated these new adjectives for "conceptual similarity" with the original lists. An adjective was included as part of the final pool if it was significantly more related to its designated concept (e.g., depression-relevant) than to the alternative (i.e., anxiety-relevant or control) concepts. The adjectives were then equated on social desirability, word frequency, and word length, and the valence of each list was balanced, so that half of the adjectives of each content type were positive and half were negative. The final pool of 72 adjectives (24 DR, 24 AR, and 24 C), shown in Table 4-1, served as the stimuli in both of our studies.

Subjects and Assessment

Sixty undergraduates (16 depressed, 17 anxious but nondepressed, and 27 nondepressed–nonanxious, or normal) participated in the Greenberg and Alloy (1987) study. Subjects were classified into the three groups on the basis of their scores on the BDI (Beck *et al.*, 1961) and the TAI (Spielberger *et al.*, 1970). Individuals scoring 9 or above on the BDI were classified as depressed, regardless of their anxiety scores. Subjects scoring 38 or above on the TAI but 8 or below on the BDI were classified as anxious but nondepressed.¹ Subjects were assigned to the normal group if they scored 8 or below on the BDI and 37 or below on the TAI. It

Table 4-1. Trait Adjectives Used in the Experimental Tasks

	Control		Depression-relevant		Anxiety-relevant	
Positive	Tactful	Cordial	Worthy	Energetic	Relaxed	Competent
	Congenial	Honest	Outgoing	Ambitious	Serene	Graceful
	Cooperative	Ethical	Potent	Enthusiastic	Calm	Assured
	Scrupulous	Nice	Valuable	Praiseworthy	Secure	Comfortable
	Genuine	Mannered	Loveable	Lively	Unruffled	Invulnerable
	Polite	Amiable	Motivated	Eager	Confident	Consistent
Negative	Thoughtless	Obnoxious	Withdrawn	Shameful	Tense	Shaky
	Uncivil	Ungrateful	Inadequate	Uninspired	Nervous	Unsafe
	Phony	Rude	Powerless	Insignificant	Jittery	Edgy
	Nosy	Immoral	Lazy	Sluggish	Anxious	Inconsistent
	Crude	Disrespectful	Weak	Ineffective	Touchy	Unsteady
	Discourteous	Unprincipled	Deficient	Lowly	Irritable	Offensive

should be noted that the depressed group was as anxious as the anxious group on the TAI, but was significantly more depressed than the anxious group on the BDI. This is not surprising, given our preceding review of clinical and psychometric studies suggesting that it is almost impossible to find depressed subjects who do not also exhibit symptoms of anxiety. Finally, to increase the reliability of subjects' group classification, subjects were required to meet these criteria on two different testing occasions separated by a 1-week interval.

Identical subject groups and selection criteria were employed in the Vazquez and Alloy (1987) study, with one exception. Because some investigators have suggested that schematic processes in depression depend upon the severity of depressive symptoms (e.g., Kuiper & Derry, 1982; Kuiper & MacDonald, 1982), two different groups of depressed subjects were formed. Based on Beck's norms (Beck *et al.*, 1961), subjects were assigned to a mildly depressed group if they scored between 9 and 15 on the BDI, and to a moderately depressed group if they scored 16 or above on the BDI. A total of 64 undergraduates (16 mildly depressed, 16 moderately depressed, 16 anxious but nondepressed, and 16 nondepressed-nonanxious) participated in Vazquez and Alloy's study.

Experimental Design and Procedure

In Greenberg and Alloy's study, subjects were exposed to a typical incidental learning task, in which the 72 trait adjectives of six different content-by-valence combinations (DR+, DR-, AR+, AR-, C+, C-) were presented randomly following one of three different orienting questions (self-referent, best-friend-referent, and semantic).² The subjects' task was to respond "yes" or "no" to each orienting question by pressing the appropriate button on a computer keyboard ("Describes you?" for the self-referent question, "Describes your best friend?" for the other-referent question, or "Means the same as ____?" for the semantic question).³ Subjects' responses and reaction times were recorded by the microcomputer (see Greenberg & Alloy, 1987, for details of the design and procedure). After all adjectives were presented twice, subjects were given an unexpected 5-minute free-recall test in which they were to write down all of the adjectives they could remember, in any order.

The incidental learning task in Vazquez and Alloy's study was identical, with two exceptions. Instead of using six different types of adjectives (resulting from the combination of the three adjective contents by their valence), Vazquez and Alloy regrouped these six categories into just four types of trait adjectives: 16 depressed-type (i.e., DR negative) adjectives, 16 anxious-type (i.e., AR negative) adjectives, 16 nondepressed-nonanxious-type (i.e., a combination of positive AR and positive DR) adjectives, and 16 control-type (i.e., a combination of positive and negative C) adjectives. In addition, four different orienting questions were used; three of them (self-referent, best-friend-referent, and semantic) were the same as in Greenberg and Alloy (1987), and a new question (people-referent: "Describes people in general?") was added. Each of the 16 adjectives of the four types was presented once, following one of the four kinds of cue questions. The order of presentation

was randomized for each subject. A surprise recognition test followed. For this purpose, a list of 64 new adjectives was constructed; a synonym was found for each of the original adjectives so that each old adjective had a corresponding distractor in the recognition test. Thus, in the recognition test, 128 adjectives were presented randomly, and the subjects' task was to decide, for each one, whether or not it was presented in the earlier judgment task.⁴

Content of Schemata

Analyses of the number of "yes" responses to the cue questions provided a way of assessing the content of subjects' self- and other-schemata. Results from both studies suggested that nondepressed-nonanxious subjects are characterized by a highly positive self-schema, anxious subjects by a more negative self-schema only somewhat specific to anxiety-relevant content, and depressed subjects by a balanced, mixed-content self-schema containing both positive and negative content.

In Greenberg and Alloy's study, as predicted, there were no group differences for the number of "yes" responses to C content stimuli. However, the group effects for the DR and AR adjectives were significant (see Figure 4-1). Depressed and anxious students both judged fewer positive DR and AR adjectives as self-descriptive than did normal (nondepressed-nonanxious) students, but there were no differences between the depressed and anxious groups. For the negative DR stimuli, the normal group endorsed fewer items than both the depressed and anxious groups, and the anxious subjects endorsed fewer items than the depressed group. For the negative AR stimuli, there were no differences between the depressed and anxious groups, replicating the pattern for the positive AR stimuli. However, the normal group judged fewer negative AR items as self-descriptive than did the anxious and depressed students. Thus, for negative adjectives, the depressed group could be differentiated from the anxious group by their greater endorsement of DR adjectives, but the two groups rated an equally high number of AR adjectives as self-descriptive.

An examination of adjective endorsement patterns within each group revealed that normal students endorsed more positive than negative items for each of the three content types, suggesting an overall positive view of the self for these subjects. However, depressed students endorsed an equal number of positive and negative DR and AR adjectives, suggesting that their self-concepts contain both positive and negative content. The anxious students rated more positive than negative items as self-descriptive for the C and DR stimuli, but more negative than positive AR adjectives. This finding was unique to this group, although a similar but nonsignificant trend was noted for depressed subjects.

Vazquez and Alloy obtained a similar pattern of endorsements for the self-referent orienting task,⁵ including the finding that depressed students' responses were again more balanced than those of normal and anxious students. In fact, Vazquez and Alloy's results suggested that this positive-negative "evenhandedness" may depend on the severity of depressive symptoms. Rating differences between positive and negative adjectives were smaller for moderately depressed

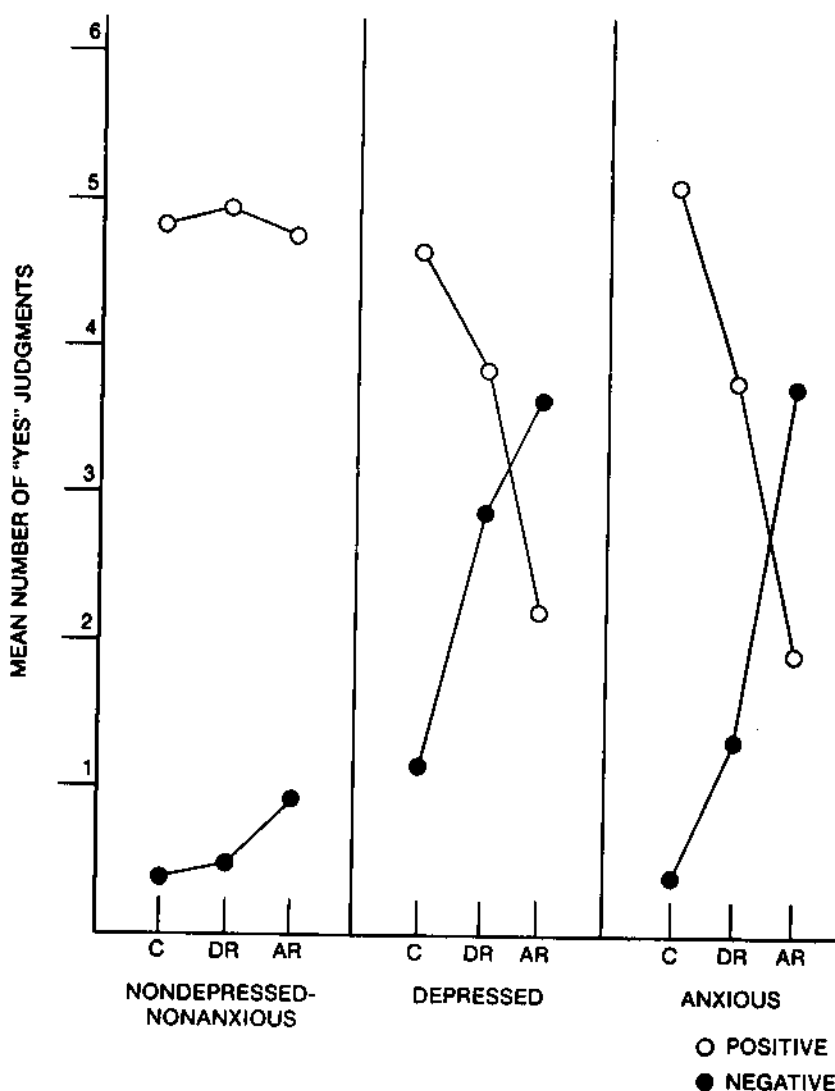


Figure 4-1. Self-schema: Mean number of "yes" judgments of positive and negative control (C), depression-relevant (DR), and anxiety-relevant (AR) adjectives for nondepressed-nonanxious (normal), depressed, and anxious subjects.

subjects than for mildly depressed subjects, whose positive-negative rating differences were, in turn, smaller than for either normal or anxious subjects.

In addition, Vazquez and Alloy (1987) conducted an analysis of the "extremity" of subjects' self-referent judgments. That is, we examined the number of subjects within each group who failed to give at least one "yes" response to each

particular type of adjective, and the number who responded affirmatively to all the adjectives belonging to that particular content type. As can be seen in Table 4-2, 78% of the normal subjects selected all of the nondepressed–nonanxious adjectives as self-descriptive, whereas this was the case for only 36% of the anxious and 20% of the depressed subjects (18% of the mildly depressed and 25% of the moderately depressed subjects). Yet, 80% of the normal and 75% of the anxious subjects rejected all the depressed-content adjectives as self-descriptive, whereas only 54% of mildly depressed and 25% of moderately depressed subjects did so. Thus it is interesting that in a situation in which subjects *must* make a decision (“yes” or “no”), clear differences emerge in the content of the self-referent judgments of all the participating groups. Under such conditions, normal subjects systematically endorse positive adjectives and reject negative ones. That there was no depressed subject who rated as self-descriptive all of the presented depressive adjectives is not surprising. In fact, even clinically depressed subjects may *not* be characterized by having an extreme negative view of themselves (e.g., Dobson & Shaw, 1987; Derry & Kuiper, 1981). However, taken together, our two studies suggest that as the severity of depressive symptoms increases from nondepressed to mild to moderate depression, the ratio of negative to positive depression-relevant adjectives endorsed as self-descriptive also increases.

With respect to the content of other-schemata, both of our studies found that students’ schemata for their best friends were, in general, very positive. Subjects consistently ascribed many positive and very few negative adjectives of all content types to their best friends. Obviously, given this pattern of responses, it is clear that depressed and anxious subjects’ best-friend schemata were more positive than their self-schemata. In contrast, normal subjects’ self-schemata and best-friend schemata were similar, and both were highly positive.

However, subjects’ concepts of “people in general” were not as uniformly positive as their concepts of “best friend” in Vazquez and Alloy’s study. In general,

Table 4-2. Extremity of Self-referent Judgments (Vazquez & Alloy, 1987)

Adjective content	Subject group			
	Normal	Anxious	Mildly depressed	Moderately depressed
Percent of subjects who responded that all adjectives of a given category were self-descriptive				
Nondepressed–nonanxious	78	36	18	25
Anxious	0	18	12	36
Depressed	0	0	0	0
Percent of subjects who rejected all adjectives of a given category as self-descriptive				
Nondepressed–nonanxious	0	0	0	6
Anxious	42	0	0	6
Depressed	80	75	54	25

when differences emerged, subjects ascribed fewer positive and more negative adjectives to people in general than to either themselves or their best friends. Yet, there were some very interesting exceptions to this generalization. For AR adjectives, depressives' view of people in general *and* of themselves was more negative than their best-friend concepts; moreover, moderately depressed subjects' self-schemata were even *worse* than their best-friend *and* their people-in-general schemata. This latter finding is important because it was the only case in which a group of subjects rated themselves more negatively than people in general.

Efficiency of Schemata

An examination of subjects' reaction times in processing self- and other-referent information is thought to provide evidence regarding the efficiency of self- and other-schemata for processing schema-relevant content.⁶ Greenberg and Alloy (1987) obtained an intriguing set of findings with regard to processing speed. Inspection of Figure 4-2 shows that normal and anxious students were faster in responding "yes" to positive than to negative adjectives but were slower in responding "no" to positive than to negative items. The mean differences here were quite large, often exceeding 1,000 milliseconds. However, depressives' reaction times did not differ for either positive or negative adjectives when responding "yes" or "no," but instead were "evenhanded." Thus depressed subjects did not exhibit any facilitation when processing personal information, whereas normal and anxious subjects showed a clear pattern of "efficiency/inefficiency," depending upon the type of information they were processing about themselves.

This "balanced" pattern of reaction times displayed by depressed subjects was also found in the Vazquez and Alloy study. Interestingly, the severity of depression affected the speed of responding only to depressed-type adjectives, not to nondepressed-nonanxious adjectives. That is, moderately depressed subjects were slower than mildly depressed and normal subjects to decide whether or not depressed-type adjectives were self-descriptive, but both depressed groups were equally slow relative to normal subjects in deciding about nondepressed-nonanxious adjectives. Further, moderate depressives were *equally slow* for both types of decisions. Thus, similar to Greenberg and Alloy's finding, moderately depressed subjects did not process either positive or negative information efficiently in a self-referent judgment task. In addition, reaction times for "self" and "best-friend" questions were, in general, faster than times for "semantic" and "people-in-general" questions. However, moderately depressed subjects were also an exception to this finding: They did not show any facilitation in processing self-referent information; their reaction times for self-referent judgments were as slow as their times for "people-in-general" judgments.

Influence of Schemata on Memory

An analysis of subjects' recall (Greenberg & Alloy, 1987) and recognition (Vazquez & Alloy, 1987) of stimuli processed with reference to the self or others

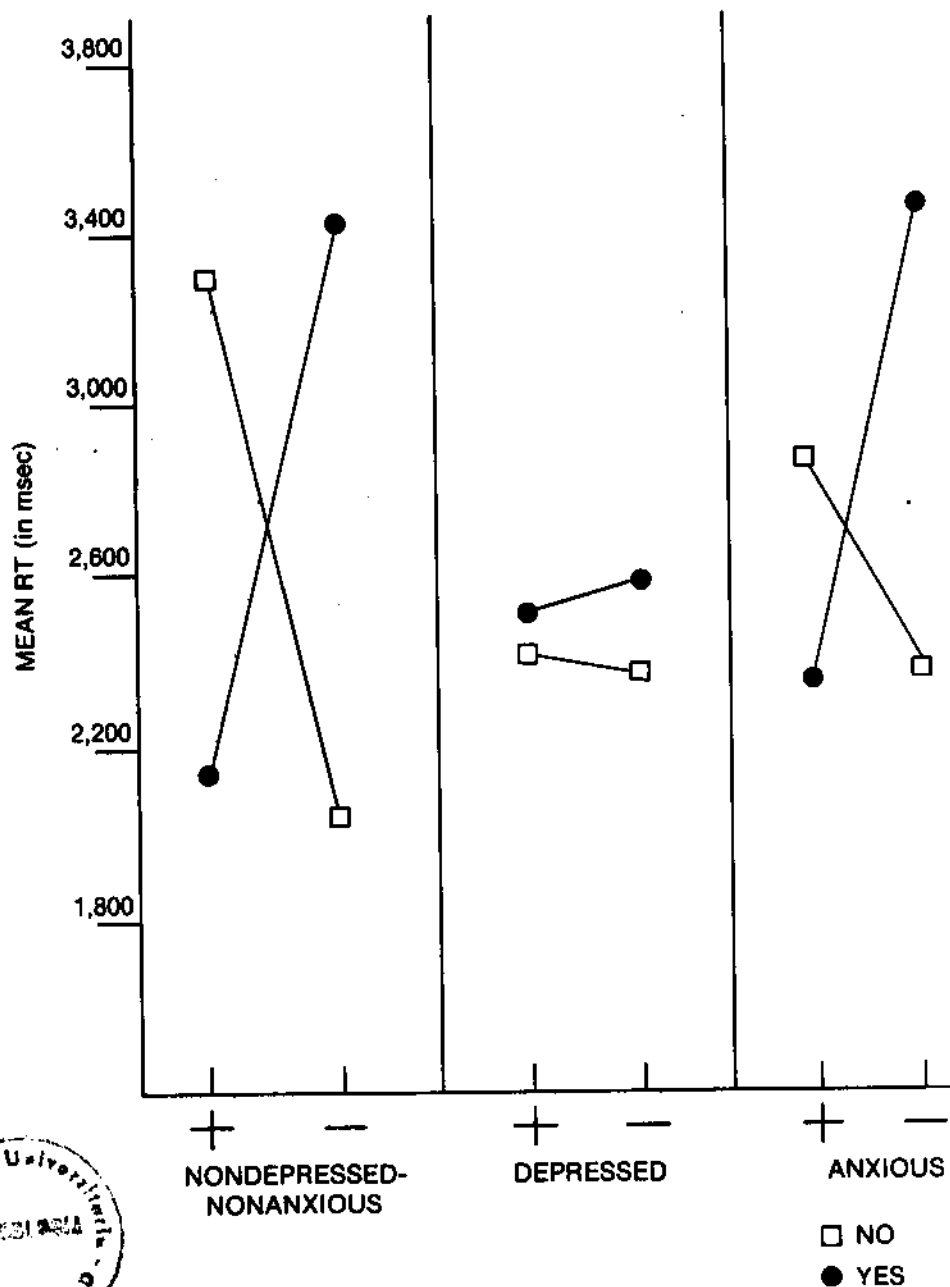


Figure 4-2. Mean reaction time (RT): Response times for positive (+) and negative (-) adjectives given "yes" and "no" ratings by nondepressed-nonanxious, depressed, and anxious subjects.

provides evidence regarding the facilitating and biasing effects of self- and other-schemata on memory for schema-relevant content. Following the typical procedure in depth-of-processing paradigms (e.g., Craik & Tulving, 1975), Greenberg and Alloy analyzed subjects' recall for "yes"- and "no"-rated adjectives separately.⁷ For "yes"-rated adjectives, there were no significant effects involving the critical subject-group factor. In general, though, all subjects exhibited enhanced recall for positively valenced adjectives encoded in self- or other-referent versus semantic fashion. In addition, all subjects recalled more positive and fewer negative adjectives for their best friends than for themselves.

Differences in subjects' recall were found for the "no"-rated adjectives. Depressed subjects recalled more negative than positive DR adjectives, whereas normal and anxious subjects did not differ in their recall of positive and negative DR adjectives. There were no differences in subjects' recall for the AR adjectives. Thus only recall of the "no"-rated DR stimuli discriminated among the three groups.

Greenberg and Alloy also obtained some important group differences when the recall data were analyzed for each content type. There were no group effects on the C stimuli, but differences emerged for the DR and AR adjectives. Figure 4-3 shows that normal subjects recalled an equal number of DR items encoded in schematic and semantic fashion for both self and other. However, both depressed and anxious subjects recalled more schematically encoded than semantically encoded self-referent DR stimuli, but not other-referent stimuli. In addition, both depressed and anxious subjects recalled more schematically encoded DR adjectives for the self than did normal subjects, whereas the three groups did not differ in their recall for others. In sum, enhanced recall of DR adjectives was restricted primarily to the depressed group, and to a lesser extent, the anxious group, with schematic effects obtained for the self-referent items but with more or less equivalent schematic versus semantic recall for all groups on the other-referent items. For the AR adjectives, anxious subjects recalled more AR items encoded with reference to the self than did either depressed or normal subjects, who did not differ in their recall levels (see Figure 4-4). In addition, there were no group differences for recall of the other-referent AR items. Finally, only the anxious group recalled more schematically encoded than semantically encoded AR adjectives for the self.

Vazquez and Alloy (1987) employed a somewhat different strategy in examining recognition memory. Subjects' recognition performances were analyzed for different types of content processed under different types of questions, regardless of subjects' responses (i.e., "yes" or "no") to the cue questions. No significant differences were obtained among the various subject groups (see also Zuroff *et al.*, 1983). Nevertheless, as in many other studies (e.g., Derry & Kuiper, 1981; Greenberg & Alloy, 1987; Rogers *et al.*, 1977), the best memory was obtained for those adjectives processed in self-referent fashion. Adjectives processed with reference to the self were recognized more frequently than adjectives processed under either "people-in-general" or "semantic" cue questions. Memory for adjectives related to "best friends" did not differ significantly from that for any of these other three orienting questions. These differences in recognition accuracy were due

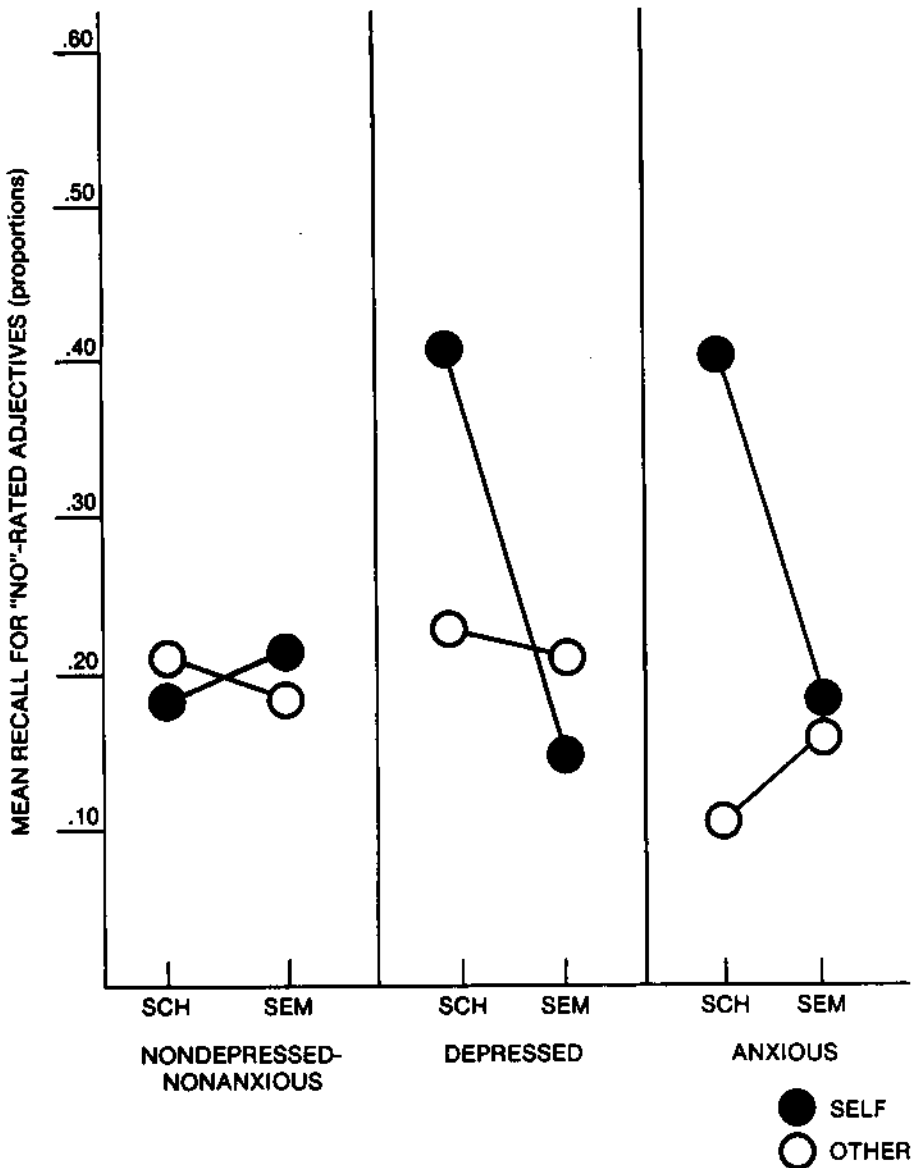


Figure 4-3. Mean recall for "no"-rated adjectives: Recall of depression-relevant adjectives under self- and other-schema (SCH) and semantic encoding (SEM) for nondepressed-nonanxious, depressed, and anxious subjects.

mainly to differences in "hits" (correct recognitions); the pattern of false alarms (distortions) was not different for the four different types of cue questions.

Unlike Rogers, Rogers, and Kuiper (1979), Vazquez and Alloy did not find an increase in false alarms on adjectives processed in self-referent fashion. One

between the judgment task and the recognition test. Indeed, Zuroff *et al.* (1983), using a similar procedure, failed to find a false-alarm effect even with a 7-day interval between the encoding task and the recognition test. Further, Vazquez and Alloy obtained a "ceiling effect" in subjects' performances on the recognition test. In effect, subjects' global performances were very good, and therefore distortions in memory did not emerge.

One of the main reasons for using a recognition test in the Vazquez and Alloy study was to obtain a measure of subjects' response biases. The most interesting finding was a negative response bias for adjectives processed in a self-referent manner. That is, subjects had a tendency to be "liberal" in their recognition of synonyms of adjectives originally processed in a self-referent way.

Discussion

DEPRESSION, ANXIETY, AND SELF-SCHEMATA

Taken together, subjects' patterns of endorsements, reaction times, and recall for trait adjectives encoded in reference to themselves in both the Greenberg and Alloy (1987) and Vazquez and Alloy (1987) studies provided some support for a weak version of the content-specificity hypothesis.⁸ In contrast, the recognition-memory findings of Vazquez and Alloy were not consistent with Beck's (1967, 1976; Beck & Emery, 1985) content-specificity hypothesis. Vazquez and Alloy obtained no group differences in recognition of different-content adjectives previously processed in self-referent fashion. However, as noted previously, the failure to find group differences in recognition memory may have been due to the recognition test's having been given immediately following the encoding of the adjective stimuli. With such a short delay between exposure to the adjectives and the memory test, group differences may have been attenuated. Indeed, several investigators have suggested that memory differences are minimized with recognition tests that are easy and that do not require much effort (Blaney, 1986; Isen, 1984; Roy-Byrne, Weingartner, Bierer, Thompson, & Post, 1986).

Replicating earlier findings (e.g., Derry & Kuiper, 1981; Ingram *et al.*, 1983; Kuiper & Derry, 1982), nondepressed/nonanxious individuals' self-referent processing in both studies provided relatively strong evidence that these individuals possess highly positive self-schemata. First, normal subjects were the only group that consistently judged more positive than negative adjectives as self-descriptive for all content types, and they endorsed more positive and fewer negative DR and AR adjectives than either depressed or anxious subjects. In addition, normal subjects gave very extreme self-descriptiveness judgments, with most of them endorsing *all* positive and rejecting *all* negative adjectives as self-descriptive. Second, as reflected in reaction times, normal subjects exhibited greater processing efficiency for positive than for negative self-referent information. That is, they endorsed positive adjectives as self-descriptive more quickly than negative adjectives, and rejected negative adjectives as not self-descriptive more rapidly than positive adjectives. Finally, although all subjects exhibited enhanced recall for

positive adjectives judged as self-descriptive ("yes"-rated adjectives), only the normal subjects failed to show enhanced recall for "no"-rated DR and AR adjectives encoded in reference to the self. That nondepressed-nonanxious people appear to be characterized by positive-content self-schemata is consistent with other evidence documenting "optimistic" or "self-serving" cognitive biases and illusions on the part of nondepressed individuals (e.g., Abramson & Alloy, 1981; Alloy & Abramson, 1979; Lewinsohn, Mischel, Chaplain, & Barton, 1980; see Alloy & Abramson, Chapter 8, this volume). Indeed, several authors have suggested that positive self-schemata may provide a mechanism contributing to nondepressive positive biases in perceptions and inferences about the self (Alloy *et al.*, 1987; Dykman, Abramson, Alloy, & Hartlage, 1987; Kayne & Alloy, in press).

Anxious individuals' self-referent processing provided weak, and not completely consistent, evidence for content specificity. Only anxious subjects endorsed more negative than positive AR adjectives as self-descriptive (although depressives showed a similar but nonsignificant trend), and these subjects judged fewer negative DR stimuli as descriptive than did depressed subjects. In fact, in the case of DR and C adjectives, anxious subjects, like the normal subjects, accepted more positive than negative traits as characteristic of themselves, although their judgments were not quite as extreme as those of the normal subjects. Anxious individuals were also unique in exhibiting enhanced recall for "no"-rated AR adjectives encoded in self-referent fashion, and they recalled more self-referent AR adjectives than did depressed and nondepressed-nonanxious individuals. However, they did not differ from depressed subjects in recalling "no"-rated DR adjectives. Finally, like the nondepressed-nonanxious subjects, anxious individuals more rapidly judged that positive rather than negative traits described them and that negative rather than positive traits did not describe them. Overall then, anxious individuals' self-schemata appear to contain predominantly positive content, with the exception of one negative component embodying AR themes. Consistent with numerous theories of anxiety (e.g., Beck & Emery, 1985; Epstein, 1972, 1976; Mandler, 1972; Sarason, 1975; Spielberger, 1972), these themes include self-perceptions of threat, lack of confidence, and vulnerability.

Finally, depressed individuals also exhibited a unique pattern of judgments, reaction times, and recall. However, rather than being indicative of a strong negative, depressive-content self-schema, depressives' self-referent processing suggested the presence of a balanced, "mixed-content" schema, containing both positive and negative self-perceptions. Unlike the anxious and nondepressed-nonanxious subjects, depressives (both mild and moderate) showed no preference for ascribing either positive or negative DR and AR adjectives to themselves. That is, they were evenhanded and not very extreme in their self-descriptions. In addition, depressives were unique in exhibiting equivalent reaction times for rating positive and negative traits, and slow reaction times for both types of traits, thus failing to show especially efficient processing of either type of stimulus. Kuiper (1981) found that adjectives that are moderately self-descriptive are processed more slowly than either highly descriptive or highly nondescriptive traits. If depressives' self-schemata contain mixed positive and negative content, then both positive and negative adjectives would be moderately self-descriptive for depressives and would

be expected to be processed relatively slowly. Finally, depressives were the only group to recall more negative than positive "no"-rated DR traits; however, they exhibited enhanced recall for DR adjectives in general (both positive and negative) when these adjectives were encoded in self-referent as compared to semantic fashion.

Depressives' evenhanded processing and recall of positive and negative self-referent information in our studies is consistent with previous findings (e.g., Ingram *et al.*, 1983; Kuiper & Derry, 1982; Kuiper & MacDonald, 1982; Kuiper *et al.*, 1985) suggesting that mildly depressed individuals may have relatively disorganized self-structures, incorporating both positive and negative content. It is possible that mild depression represents a "switch point" between the strong positive self-schemata exhibited by nondepressed people and the strong negative self-schemata hypothesized for clinically depressed persons by Beck (1967, 1976) and reported by Derry and Kuiper (1981). Indeed, Davis (1979b) and Lloyd and Lishman (1975) reported that severity of depression was related to greater biases in favor of efficient processing of negative self-referent information. However, an important issue concerns the severity level of depression at which the switch point from mostly positive to mostly negative content self-schemata occurs. Vazquez and Alloy (1987) found the most balanced, evenhanded self-schemata in moderate depressives (BDI scores of 16-23) rather than in mild depressives (BDI scores of 9-15). Clearly, these findings suggest the need for further research that explicitly examines in a fine-grained fashion the effects of severity of depression, as well as other variables such as chronicity or past history of depression and anxiety, on the schematic processing of self-referent information.

That mildly or moderately depressed individuals may possess mixed positive- and negative-content self-schemata is congruent with the body of work demonstrating that such individuals often provide more accurate and realistic personal judgments than do nondepressed individuals (Abramson & Alloy, 1981; Alloy & Abramson, 1979; Alloy & Ahrens, 1987; Golin, Terrell, & Johnson, 1977; Golin, Terrell, Weitz, & Drost, 1979; Lewinsohn *et al.*, 1980; Martin *et al.*, 1984; Tabachnik *et al.*, 1983; see Alloy & Abramson, Chapter 8, this volume). Although schemata facilitate the interpretation of environmental input, an important by-product of their operation is cognitive bias and distortion (e.g., Alloy & Tabachnik, 1984; Taylor & Crocker, 1980). If some depressed individuals possess mixed-content, relatively unstable self-schemata, then their processing of personally relevant situational information should be less biased by schema-based expectations (Alloy *et al.*, 1987; Dykman *et al.*, 1987; Kayne & Alloy, in press).

SELF- VERSUS OTHER-SCHEMATA

An important question addressed by the Greenberg and Alloy (1987) and Vazquez and Alloy (1987) studies was whether self-referent processing effects are specific to the self. Kuiper and Rogers (1979) presented evidence suggesting that the presence of superior schematic versus semantic recall is a function of the degree of familiarity of the targeted individual, with superior self-recall observed only when the targeted

other was relatively unfamiliar. Therefore, to provide a stringent test of the content specificity of self-schema processing, we used both a highly familiar other (best friend) and a generalized, unfamiliar other (people in general) as the comparison targets in our studies.

The results of the trait-rating tasks clearly showed that subjects' self-descriptiveness judgments were not characteristic of their other-descriptiveness judgments. Regardless of group membership or content type, best-friend judgments were overwhelmingly positive, and for depressed and anxious subjects, more positive than their self-referent judgments. In contrast, normal and anxious subjects' ratings of people in general were more negative than their self-ratings, whereas in some cases, depressives rated people in general even more positively than themselves. Further, self-other differences were also obtained for the recall task (Greenberg & Alloy, 1987), where more positive and less negative "yes"-rated adjectives were recalled for best friends than for the self, and where depressed and anxious subjects exhibited enhanced schematic recall for DR and AR "No"-rated stimuli for themselves but not for their best friends. Finally, on the recognition test (Vazquez & Alloy, 1987), adjectives processed in reference to the self were recognized more frequently than those processed in reference to people in general.

These self-other differences contradict proposals that the self is important only so far as it leads to the accessing of a rich cognitive structure (Bellezza, 1984; Ganellen & Carver, 1985). According to this view, any advantage to self-referent processing would be minimized when compared to cognitive structures equivalent in richness and semantic elaboration (e.g., a highly familiar other). Thus the use of best friends as one of the comparison targets in our studies supports previous investigations (Greenwald & Pratkanis, 1984; Mueller, Thompson, & Davenport, 1984) demonstrating different schematic processing for self and other, and strengthens the conclusion that self-referent processing is unique to the self.

The self-other distinction also figures prominently in Beck's cognitive theory of depression and anxiety (Beck, 1967, 1976; Beck & Emery, 1985). A social-comparison hypothesis (Alloy *et al.*, 1987; Kuiper & MacDonald, 1982) suggested that depressed and anxious individuals would exhibit negative self-schemata but positive-content schemata for others, whereas nondepressed-nonanxious persons would exhibit more positive self- than other-schemata. In contrast, a self-consensus hypothesis (Fong & Markus, 1982; Markus & Smith, 1981) suggested that the presence of an organized self-schema biases an individual to perceive others in a fashion similar to the way in which they perceive themselves. The self-consensus hypothesis received little support in our studies. Clear self-other differences were found, as outlined previously, in the trait-rating task and in the recall and recognition of trait adjectives. Alternatively, the social-comparison hypothesis was corroborated. Depressed and anxious subjects' judgments for themselves were clearly more negative than their judgments for their best friends, particularly for the DR and AR traits, respectively. Moreover, moderately depressed subjects' self-ratings were even more negative than their ratings of a generalized other (people in general). In contrast, normal subjects judged their best friends as positively as themselves but did depreciate "people in general" relative to themselves, as ex-

pected (see also Tabachnik *et al.*, 1983). By possessing self-schemata that are at least as positive as their schemata for others (if not more so), nondepressed-nonanxious people, in contrast to depressed and anxious people, may be able to maintain high self-regard and may be less prone to social-comparison-induced threats to self-esteem (Alloy *et al.*, 1987).

LIMITATIONS OF THE STUDIES AND FUTURE DIRECTIONS

The Greenberg and Alloy (1987) and Vazquez and Alloy (1987) investigations go beyond prior studies of depression and schematic processing of self-referent information in two ways. First, by explicitly comparing the schematic processes of depressed individuals and anxious but nondepressed individuals, these studies provide information regarding the ways in which depressed persons' self-schemata are both similar to and different from those of anxious persons. Inasmuch as depressed individuals are not only more depressed, but also often more anxious, than nondepressed individuals, our findings suggest the importance of including an anxiety control group in studies comparing depressed and nondepressed people's schemata. Second, by including stimuli that differed in content as well as in valence, our experiments demonstrated some differences among depressed, anxious, and normal individuals' self-schemata that are in line with Beck's content-specificity hypothesis. These findings suggest that future research designed to investigate psychopathological individuals' schematic processes would do well to consider the specific content of the stimuli to be processed as well as whether these stimuli are positive or negative (Riskind & Rholes, 1984).

Despite these advances, some limitations in the current work suggest meaningful directions for further research. Although our findings provided support for a weak version of the content-specificity hypothesis, depressed and anxious subjects' self-referent processing exhibited some overlap as well as some differences. Of course, the overlap may reflect real underlying similarities in depressed and anxious persons' self-schemata; however, several factors in our designs may have contributed to less than perfect differentiation. First, subjects were separated into depressed and anxious groups on the basis of their scores on the BDI (Beck *et al.*, 1961) and the TAI (Spielberger *et al.*, 1970). Yet, an examination of the items on these two questionnaires reveals considerable overlap in their content. Use of different self-report inventories or other methods for selecting depressed and anxious groups may lead to greater specificity of the two groups' self-schemata (see Riskind *et al.*, 1986). In particular, a comparison of the schematic processing of individuals meeting DSM-III criteria for depressive versus anxiety disorders may be an especially profitable direction for further research in this area. Similarly, as noted previously, further work is needed in order to understand the relationship between severity and chronicity of depressive and anxious symptoms and self-schemata (Davis, 1979a, 1979b; Davis & Unruh, 1981; Kuiper & Derry, 1982; Kuiper & MacDonald, 1982).

Second, although considerable care was taken in selecting appropriate DR and

AR adjectives for use in our studies (see Selection and Matching of Task Stimuli section), the stimuli may not fully capture potential content differences in self-schemata associated with depression versus anxiety because they were validated against separate groups of depressed and anxious subjects also classified on the basis of BDI and TAI scores. Thus further work on the stimulus content included in studies of depressed and anxious people's schematic processes may also be needed.

Finally, an important direction for future research that may help to disentangle the schematic processes involved in depression and anxiety is the examination of schematic processes among normal individuals that contribute vulnerability to the development of depressive versus anxious symptoms. Several such research programs are already under way (Alloy, Clements, Kolden, & Tal, 1987; Hammen, Marks, de Mayo, & Mayol, 1985; Hammen, Marks, Mayol, & de Mayo, 1985; Kuiper *et al.*, 1985; Kuiper, Olinger, & MacDonald, Chapter 10, this volume).

In summary, the findings presented here support the differentiation of depression and anxiety as partially distinct phenomena. Normal, depressed, and anxious subjects each exhibited a unique pattern of schematic effects for information processed in reference to the self. These findings suggest that a cognitive-information-processing approach may provide a useful theoretical framework for understanding the similarities and differences between anxious and depressive states.

NOTES

1. The cutoff scores of 9 or above on the BDI and 38 or above on the TAI represent the upper quartiles of these inventories for Northwestern University students.
2. Each adjective was presented twice, in a different random order each time. Half of the adjectives in each content-by-valence combination were associated with the semantic orienting question and half were associated with either the self- or the other-referent orienting question on both presentations.
3. For the semantic orienting question, a list of synonyms and nonsynonyms was constructed so that half of subjects' responses would be "yes" and half would be "no."
4. To study the temporal consistency of memory for self- and other-referent information, Vazquez and Alloy (1987) gave a second, unexpected recognition test immediately following the first one. Although memory performance was worse on the second test, there were no interesting effects of subject group or adjective content, and thus the results from the second recognition test are not presented here.
5. The major difference was that anxious subjects ascribed more nondepressed-nonanxious-type adjectives to themselves than did anxious subjects in Greenberg and Alloy's (1987) study.
6. In both the Greenberg and Alloy (1987) and Vazquez and Alloy (1987) studies, there were a number of cases in which subjects failed to give any "yes" (or "no") responses to either positive or negative adjectives of particular content types. Consequently, those subjects had missing reaction times in such cases. To deal with this problem, Greenberg and Alloy conducted several "patch-up" analyses, collapsing over one or more factors of the experimental design (see Greenberg & Alloy, 1987, for details). Vazquez and Alloy adopted a somewhat different approach, combining subjects' "yes" and "no" responses for the purpose of analysis.

7. See Greenberg and Alloy (1987) for a discussion of the most appropriate dependent measures to use in analyzing recall data.
8. See Greenberg and Alloy (1987) and Vazquez and Alloy (1987) for some cautions in considering the findings of our two studies.

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